APPENDIX 4

ENHANCED VAPOR RECOVERY TECHNOLOGY REVIEW

UPDATED EVR COST ANALYSIS SPREADSHEET

COST-EFFECTIVENESS SUMMARY

Input Values Used in Cost Analysis

Input variable used in Cost Analysis	Input value for each Model GDF				
	1	2	3	4	5
Nominal Monthly Average Sales per GDF, gals/month-GD	13,233	37,500	75,000	150,000	300,000
Population Distribution (EPA, 1991 adjusted to fit current p	4.7%	14.1%	45.7%	31.3%	4.2%
Estimated Number of GDFs (11,250 total)	531	1,586	5,136	3,522	475
Total Annual Sales, million gals/yr	84	714	4,626	6,344	1,712
Number of Processors per GDF (when applicable)	1	1	1	1	1
Number of Drop Tubes & Spill Buckets per GDF	2.5	2.5	2.5	2.5	2.5
Wtd-Avg Number of Nozzles per GDF (EPA, 1991)	2.5	3.25	6.5	9.75	16.25
Number of Dispensers per GDF (EPA, 1991)	2	3	6	9	12

Est. population-wtd average gallons per month using popu	99,779	Total 1997 CA gasoline sales =	13,481,725,000	gals
Actual population-wtd average gallons per month	99,865	Total GDFs in CA in 1998 =	11,250	

Emission Reductions per Model GDF

Module	Description	2010 ROG Reductions Statewide, tons/day	Emission Reductions by Model GDF and Module, tons/day				
			1	2	3	4	5
1	Phase I	5.0	0.03	0.26	1.72	2.35	0.64
2	Phase II	3.1	0.02	0.16	1.06	1.46	0.39
3	ORVR Compatibility	6.3	0.04	0.33	2.16	2.96	0.80
4	Liquid Retention	0.2	0.00	0.01	0.07	0.09	0.03
5	Spillage/Dripless Nozzl	3.9	0.02	0.21	1.34	1.84	0.50
6	In-Station Diagnostics	6.6	0.04	0.35	2.26	3.11	0.84
	Total	25.1	0.16	1.33	8.61	11.81	3.19

Cost-Effectiveness (C.E.) & Impacts to GDFs and Consumers

Module	Description	Cost-Effectiveness by Model GDF and Module, 1999 Dollars per Pound ROG Reduced					Overall Cost-Effectiveness by Module only
		1	2	3	4	5	
1	Phase I C.E. (Annual Costs/Annual Reductions)	$5.31	$1.72	$0.74	$0.25	$0.01	$0.50
	Annualized Equip Costs (assumes 25%/yr conv	$76,962.74	$229,909.89	$744,386.28	$510,432.58	$68,875.13	
	Annualized R&D Costs (assume 5% of Total R&	$29,649.52	$88,571.65	$286,771.14	$196,641.63	$26,533.81	
	Annualized Cert & Testing (assume 5% of Tota	$20,103.77	$60,055.77	$194,444.38	$133,332.32	$17,991.17	
	Annual Gasoline Recovery Credit	($5,435.46)	($46,052.87)	($298,213.56)	($408,975.61)	($110,370.11)	
2	Phase II C.E. (Annual Costs/Annual Reductions)	$57.41	$20.73	$11.65	$6.41	$3.44	$8.91
	Annualized Equip Costs (assumes 25%/yr conv	$318,373.12	$1,028,725.48	$4,420,223.60	$3,778,060.20	$611,144.09	
	Annualized R&D Costs (assume 50% of Total R	$296,495.18	$885,716.53	$2,867,711.42	$1,966,416.33	$265,338.06	
	Annualized Cert & Testing (assume 50% of Tot	$201,037.74	$600,557.65	$1,944,443.82	$1,333,323.17	$179,911.74	
	Annual Gasoline Recovery Credit	($3,369.98)	($28,552.78)	($184,892.41)	($253,564.88)	($68,429.47)	
3	ORVR Compatibility (Annual Costs/Annual Reduc	$4.03	$1.38	$0.77	$0.37	$0.14	$0.55
	Annualized Equip Costs (assumes 25%/yr conv	$23,213.82	$97,188.07	$629,337.57	$647,313.92	$129,762.72	
	Annualized R&D Costs (assume 10% of Total R	$59,299.04	$177,143.31	$573,542.28	$393,283.27	$53,067.61	
	Annualized Cert & Testing (assume 10% of Tot	$40,207.55	$120,111.53	$388,888.76	$266,664.63	$35,982.35	
	Annual Gasoline Recovery Credit	($6,848.68)	($58,026.62)	($375,749.09)	($515,309.27)	($139,066.34)	
4	Liquid Retention (Annual Costs/Annual Reduction	$62.15	$22.59	$12.99	$7.28	$4.43	$10.03
	Annualized Equip Costs (assumes 25%/yr conv	$7,213.57	$28,013.73	$181,401.80	$186,583.34	$41,960.99	
	Annualized R&D Costs (assume 5% of Total R&	$29,649.52	$88,571.65	$286,771.14	$196,641.63	$26,533.81	
	Annualized Cert & Testing (assume 5% of Tota	$20,103.77	$60,055.77	$194,444.38	$133,332.32	$17,991.17	
	Annual Gasoline Recovery Credit	($217.42)	($1,842.11)	($11,928.54)	($16,359.02)	($4,414.80)	
5	Spillage/Dripless Nozzle (Annual Costs/Annual R	$2.96	$0.93	$0.44	$0.15	$0.00	$0.29
	Annualized Equip Costs (assumes 25%/yr conv	$7,213.57	$28,013.73	$181,401.80	$186,583.34	$41,960.99	
	Annualized R&D Costs (assume 5% of Total R&	$29,649.52	$88,571.65	$286,771.14	$196,641.63	$26,533.81	
	Annualized Cert & Testing (assume 5% of Tota	$20,103.77	$60,055.77	$194,444.38	$133,332.32	$17,991.17	
	Annual Gasoline Recovery Credit	($4,239.66)	($35,921.24)	($232,606.58)	($319,000.98)	($86,088.69)	
6	In-Station Diagnostics (Annual Costs/Annual Red	$19.55	$7.18	$4.12	$2.27	$1.18	$3.14
	Annualized Equip Costs (assumes 25%/yr conv	$347,474.77	$1,149,659.24	$4,806,783.92	$4,039,706.08	$645,441.32	
	Annualized R&D Costs (assume 25% of Total R	$148,247.59	$442,858.26	$1,433,855.71	$983,208.16	$132,669.03	
	Annualized Cert & Testing (assume 25% of Tot	$100,518.87	$300,278.83	$972,221.91	$666,661.59	$89,955.87	
	Annual Gasoline Recovery Credit	($7,174.81)	($60,789.79)	($393,641.90)	($539,847.81)	($145,688.55)	
	Total Annual Costs by Model GDF Category	$1,748,231.43	$5,302,873.09	$19,090,813.36	$13,895,100.87	$1,875,586.87	**$41,912,606**
	Total Annual Costs per each GDF in a Model GD	**$3,292.34**	**$3,343.02**	**$3,717.17**	**$3,945.57**	**$3,946.94**	*overall annual cost*
	Per-gallon cost increase for consumers, cents/ga	**2.07**	**0.74**	**0.41**	**0.22**	**0.11**	**0.31**
	Non-Wtd Cost-Effectiveness for All Modules by M	$15.25	$5.46	$3.04	$1.61	$0.81	*vg. per-gal increas*

(cents per gallon)

Notes:

Gasoline price/gal assu $1.50

Per-gallon increase for consumers assumes all costs passed on to consumers

Gasoline density, lb/gal 6.3